CALIBRATION STANDARD SPECIFICATION

FOR A

HIGH VACUUM PUMP

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PROCUREMENT PACKAGE

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HIGH VACUUM PUMP

1. SCOPE

1.1 Scope. This specification defines the mechanical, electrical, and electronic characteristics for a two stage High Vacuum Pump. This equipment is intended to be used by Navy personnel in shipboard and shorebased laboratories to remove air and/or other gases from an enclosed pressure system for the purpose of calibrating pressure gauges, switches, transducers, transmitters and other pressure measuring devices. For the purposes of this specification, the High Vacuum Pump shall be referred to as the HVP.

2. APPLICABLE DOCUMENTS

2.1 Controlling Specifications. MIL-T-28800, "Military Specification, Test Equipment for use with Electrical and Electronic Equipment , General specification for" and all documents referenced therein of the issues in effect on the date of this solicitation shall form a part of this specification.

3. REQUIREMENTS

3.1 General. The HVP shall conform to the Type II, Class 5, Style E requirements as specified in MIL-T-28800 for Navy shipboard and shorebased use as modified below. The use of material restricted for Navy use shall be governed by MIL-T-28800.

3.1.1 Design and Construction. The HVP design and construction shall meet the requirements of MIL-T-28800 for Type II equipment.

3.1.2 Power Requirements. The HVP shall operate from a source of 103.5V to 126.5V at 50 Hz and 60 Hz ±5% single-phase, 10 Amp input power.

3.1.2.1 Fuses or Circuit Breakers. Fuses or circuit breakers shall be provided. If circuit breakers are used, both sides of the power source shall be automatically disconnected from the equipment in the event of excessive current. If fuses are used, only the line side of the input power line, as defined by MIL-C-

28777, shall be fused. Fuses or circuit breakers shall be readily accessible.

3.1.2.2 Power Connection. The requirements for power source connections shall be in accordance with MIL-T-28800 with a 8-foot minimum length cord.

3.1.3 Dimensions and Weight. Maximum dimensions shall not exceed 8 inches in width, 14 inches in height, and 24 inches in depth. The HVP weight shall not exceed 60 pounds.

3.1.4 Lithium Batteries. Per MIL-T-28800, lithium batteries are prohibited without prior authorization. A request for approval for the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

3.2 Environmental Requirements. The HVP shall meet the environmental requirements for a Type II, Class 5, Style E equipment with the deviations specified below.

3.2.1 Temperature and Humidity. The HVP shall meet the conditions below:

	Temperature (°C)	Relative Humidity (%)
Operating	10 to 30	95
	30 to 40	75
Non-operating	-40 to 70	Not Controlled

3.2.2 Electromagnetic Compatibility. The electromagnetic compatibility requirements of MIL-T-28800 are limited to the following areas: CE01, CE03, CS01, CS02, CS06, RE01, RE02 (14 kHz to 1 Ghz), and RS03.

3.3 Reliability. Type II reliability requirements are as specified in MIL-T-28800.

3.3.1 Calibration Interval. The HVP shall have an 85% or greater probability of remaining within tolerances of all specifications at the end of a 12 month period.

3.4 Maintainability. The HVP shall meet the Type II maintainability requirements as specified in MIL-T-28000 except the lowest discrete component shall be defined as a replaceable assembly. Certification time shall not exceed 60 minutes.

3.5 Performance Requirements. The HVP shall provide the following capability as specified below. Unless otherwise indicated, all specifications shall be met following a 30-minute warm-up period.

3.5.1 Free Air Displacement. The HVP shall provide a minimum free air displacement of up to 50 liters per Minute (1.8 CFM) at 60 Hz.

3.5.2 Pressure. The HVP shall meet the following pressure requirements.

3.5.2.1 Guaranteed Ultimate Pressure. The HVP shall provide a guaranteed ultimate pressure of up to $6.0x10^{-4}$ Torr(0.0006mm Hg)

3.5.2.2 Ultimate Pressure. The HVP shall provide an ultimate pressure of up to $7.0x10^{-3}$ Torr(0.007 mm Hg).

3.5.3 Motor/Pump. The HVP shall have a motor/pump that satisfies the following requirements.

3.5.3.1 Pump Speed. The HVP shall provide a pump speed of up to 1725 rpm at 60 Hz (1425 rpm at 50 Hz).

3.5.3.2 Horsepower. The HVP shall have a minimum horsepower of 1/3 hp.

3.6 Operating Requirements. The HVP shall provide the following capabilities.

3.6.1 Connections. The HVP's connections shall meet the following requirements.

3.6.1.1 Intake/Exhaust. The HVP's intake/exhaust connection shall be ISO NW25.

3.6.2 Design. The HVP shall have a two stage design.

3.6.3 Ballast. The HVP shall have a gas ballast.

3.6.4 Valves. The HVP shall have an antisuckback valve. The HVP shall have an isolation valve.

3.7 Manual. At least two copies of an operation and maintenance manual shall be provided. The manual shall meet the requirements of MIL-M-7298.

3.7.1 Calibration Procedure. A calibration procedure in accordance with MIL-M-38793 shall be provided.